



# Infrasound: Secrets of the Deep

How animals and tech use  
invisible sound

# Our Learning Goals

By the end of this lesson, we will be able to:

- **Recall** what we learned about the human hearing range and the 'Sound Detective' game.
- **Explain** how large animals like elephants and whales use infrasound to communicate.
- **Describe** how vibrations travel through air and water over long distances.
- **Design** new technology that mimics animal abilities to help humans.



# Key Vocabulary

## Propagation



**Propagation**  
Sound travels outward from a source through a medium.



**Threshold**  
The limit or boundary point where something changes, like the edge of human hearing.



**Detection**  
Detecting or noticing something, like a machine sensing an



**Acoustics**  
The science of sound. It covers how sound is made, controlled, and transmitted.

# Recap: The Sound Detectives



## Do you remember?

In our last lesson, we played the **Sound Detective** game. We learned that sound is made of **invisible vibrations**.

## Human Hearing Limits

Humans can usually hear sounds between **20Hz and 20,000Hz**.

Anything **below 20Hz** is called **Infrasound**. Because it is below our hearing **threshold**, we don't hear it with our ears—we often **feel** it as a rumble in our bodies instead!

# Why Use Infrasound?

## Going the Distance

You might wonder: if we can't hear it, why is infrasound useful?

## The Secret Power

Low-frequency sounds have very long wavelengths. This means they lose energy very slowly as they travel.

Unlike high-pitched sounds that fade away quickly, infrasound can travel **huge distances** through the air, ground, and water without getting blocked by trees or buildings.

## High Pitch



## Low Pitch (Infrasound)



Long distance

# Elephant Talk

## Giants of the Land

Elephants communicate using deep, infrasonic rumbles (5-10Hz). These sounds travel for kilometres through the air. Amazingly, elephants can feel these vibrations through their feet, pressing trunks to the ground to 'listen' to distant friends.





# Whale Songs

## Masters of the Deep & Singing Across Oceans

Blue and fin whales are Earth's largest animals. Water conducts sound well, allowing whales to use low-frequency calls to find food and mates. These calls travel thousands of kilometers, meaning a whale off Australia could be heard in Antarctica!

# Seeing the Unseen

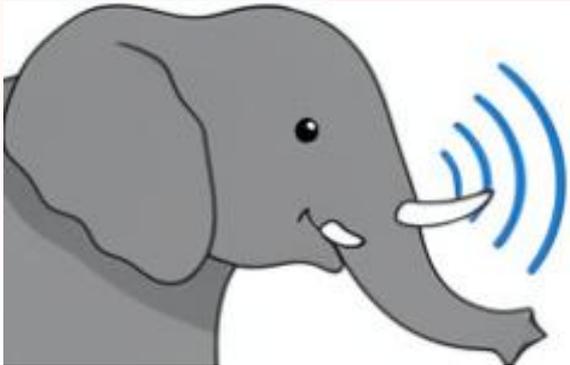


# How Infrasound Travels

1

## The Source

An animal or object creates a vibration, like an elephant rumbling or a volcano erupting.



2

## Propagation

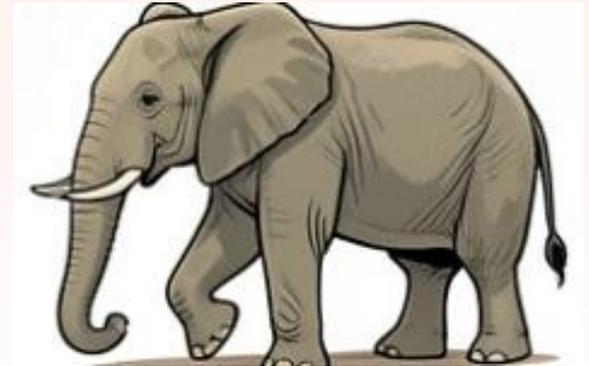
Low-frequency waves travel far through air, water, or ground.



3

## Detection

Animals sense vibrations through their bodies or special sensors.



# Quick Quiz

Answers on the next slide...

Why do elephants and whales use infrasound to communicate?

1. Because they like making loud noises
2. It travels over very long distances
3. It is the only sound they can make
4. Because humans can hear it easily

# Quick Quiz



Why do elephants and whales use infrasound to communicate?

1. Because they like making loud noises

2. **It travels over very long distances**

3. It is the only sound they can make

4. Because humans can hear it easily

# Nature vs Technology



## Copying Nature

Scientists use **biomimicry** to learn from animals. Elephants use infrasound to sense vibrations miles away. We can use infrasound detectors for early warnings of **tsunamis, volcanic eruptions, or nuclear tests**, detecting them before they are visible or audible.

# Get creative



Design an infrasound protector. Copy an animal's ability (e.g., elephant feet sensors) to detect dangers like avalanches or whales. Diagram your device, labeling parts. Explain how it warns humans (e.g., lights, phone alerts).

What you'll need: 🎨 🖌️

Paper, Pencils, Colours



Discuss!



## Thinking Deeper

How might human-made noise (like big ships or construction) affect animals that rely on infrasound to communicate?

Discuss!



### **You might have said...**

Loud noises can drown out calls, making it hard to find others.  
They can confuse animals, causing them to get lost, or scare them away from feeding/breeding grounds.

# Summary

## What We Learned Today

- **Infrasound** is sound below 20Hz that we feel rather than hear.
- **Large animals** like elephants and whales use infrasound because it travels long distances through air, ground, and water.
- **Propagation** allows these vibrations to carry messages over kilometres.
- **Technology** can mimic nature to detect disasters and protect wildlife.

Great work, Sound Detectives!

